Chapter 6:

Communicable Diseases

"Idealism increases in direct proportion to one's distance from the problem. "

John Galsworthy

"Change before you have to."

Jack Welch

"For every problem, there is one solution which is simple, neat and wrong."

Henry Louis Mencken

Communicable Diseases

Did You Know?

- Hand washing can prevent the spread of disease.
- Antibiotics are not effective for treating viral infections.
- Overuse and misuse of antibiotics results in a decrease in their effectiveness in treating bacterial diseases.
- Hepatitis B cases have increased from 1998 to 2002 in Greene County.
- The numbers of those infected with sexually transmitted diseases have increased dramatically in Greene County from 1997 to 2003.
- The Human Immunodeficiency Virus (HIV) causes Acquired Immune Deficiency Syndrome (AIDS), and there isn't a cure or vaccine for this disease.
- Many Americans wrongly believe that an HIV/AIDS vaccine already exists and that HIV infection can be cured.
- Thousands more people die of influenza (commonly called the flu) in the United States every year than by West Nile Virus infection.

Communicable and Vector-Borne Diseases

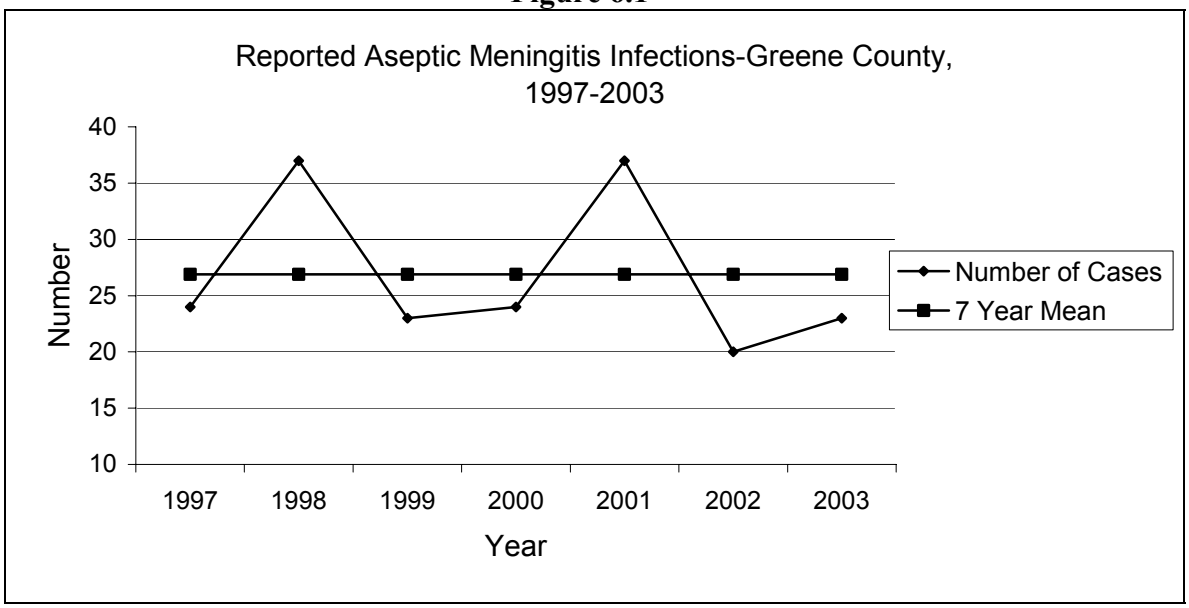
Communicable diseases are those that are transmitted from person to person, or animal to person, and involve microorganisms such as bacteria, viruses, fungi, or parasites. Specific modes of transmission are required for each pathogen to spread. Preventing the continued spread of these diseases involves breaking the chain of transmission. Identification of specific diseases in the population is one step in disease surveillance and prevention. This chapter will focus on the prevalence of certain diseases in Greene County reported by area hospitals, labs, and physicians as required by law. This list of diseases is not exhaustive, but it will focus on those reportable diseases that are a common threat to public health.

The data will illustrate trends in the number or rate for specific diseases. For comparison, the average incidence of some diseases will also be shown for the county. Use of the arithmetic mean, i.e. average, for comparison is a useful way to indicate changes that are present over time.

Aseptic Meningitis

Aseptic meningitis cases in Greene County from 1997 to 2003 are plotted in Figure 6.1. Several viral agents have been found to be associated with aseptic meningitis.

Figure 6.1

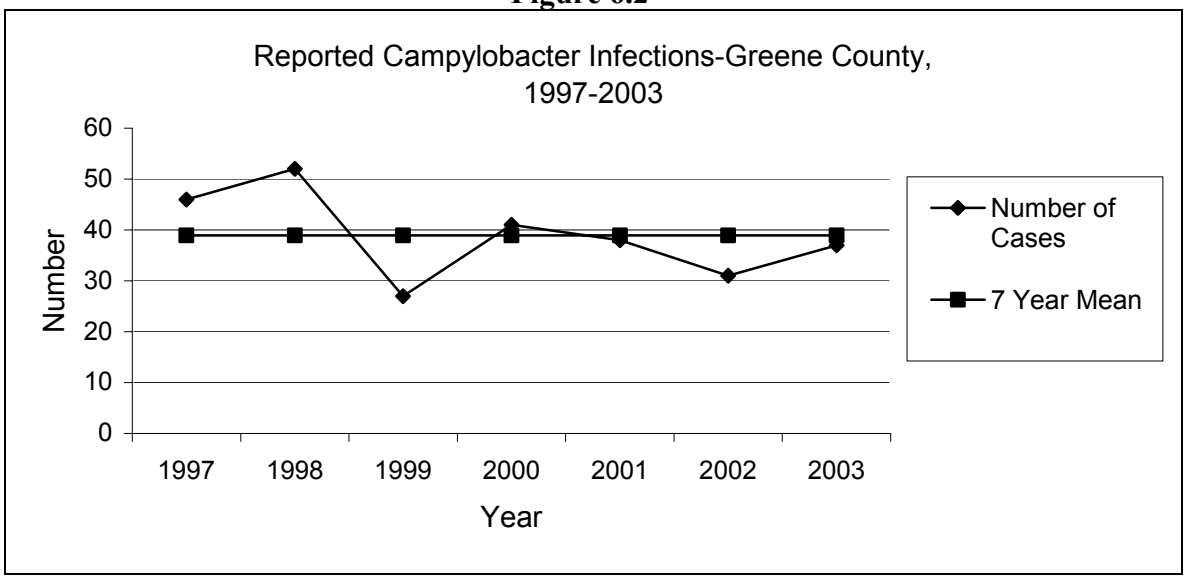


Source: Springfield-Greene County Health Department

Campylobacter

Campylobacter is a zoonotic bacterial enteric disease caused most commonly by *Campylobacter jejuni*. This illness is characterized by diarrhea, abdominal pain, malaise, fever, nausea, and vomiting. The disease occurs worldwide and is a common source of "traveler's diarrhea." The mode of transmission occurs orally through contaminated food, water, or contact with infected pets and farm animals. Figure 6.2 indicates the number of cases of Campylobacter infections declining overall from 1997, with a 7-year mean of 38.9 cases per year.

Figure 6.2

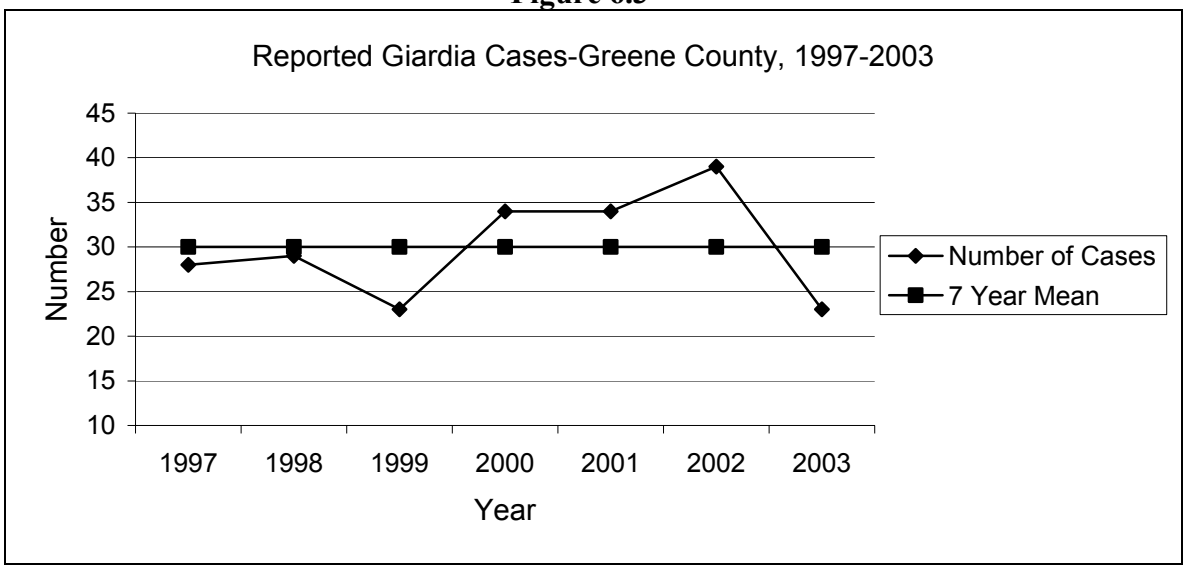


Source: Springfield-Greene County Health Department

Giardiasis (Giardia enteritis)

Giardiasis is a protozoan infection caused by *Giardia lamblia*. This infection may cause severe intestinal symptoms including diarrhea, abdominal cramps, fatigue, and weight loss. This disease occurs worldwide, with children usually being infected more often than adults. The primary mode of transmission is fecal–oral with large-scale outbreaks sometimes occurring in day care centers or institutional settings.

Figure 6.3

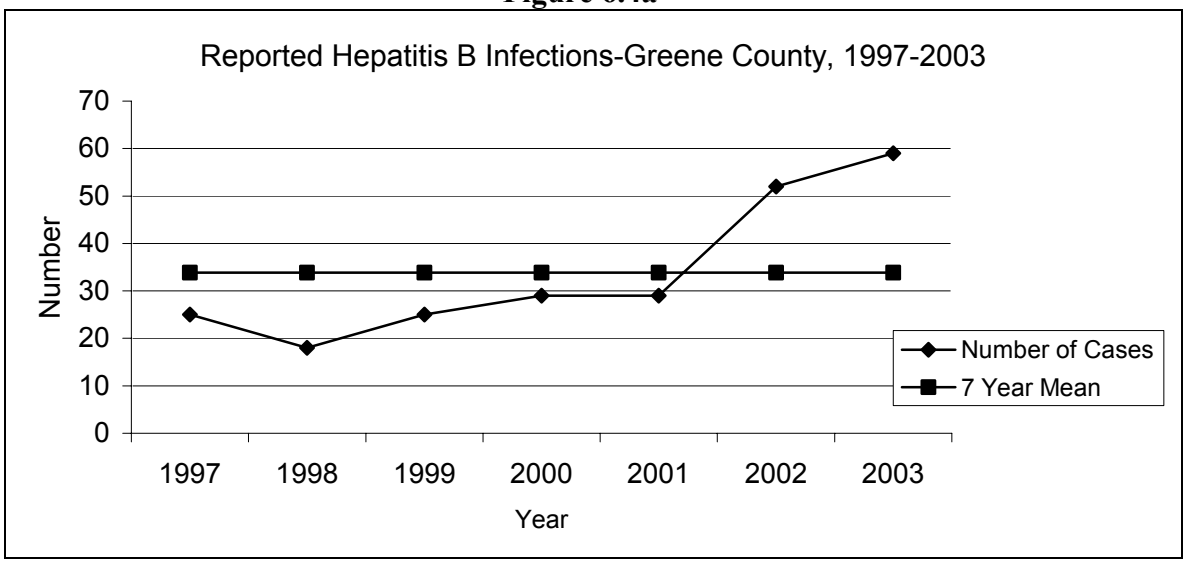


Source: Springfield-Greene County Health Department

Hepatitis B

Approximately 30% of those infected with the Hepatitis B virus (HBV) do not have signs or symptoms of infection. Symptoms of HBV infection include fatigue, abdominal pain, loss of appetite, nausea, vomiting, joint pain and jaundice. Death occurs in 15-25% of those who are chronically infected with the virus. Also, children who are infected exhibit signs or symptoms less often than adults. Hepatitis B virus is transmitted through the blood and body fluids of an infected person. Methods of transmission include unprotected sex, sharing of intravenous needles and from mother to child during pregnancy. Figure 6.4a illustrates that an increasing number of cases have been reported in Greene County with a significant jump from 2001 to 2003.

Figure 6.4a



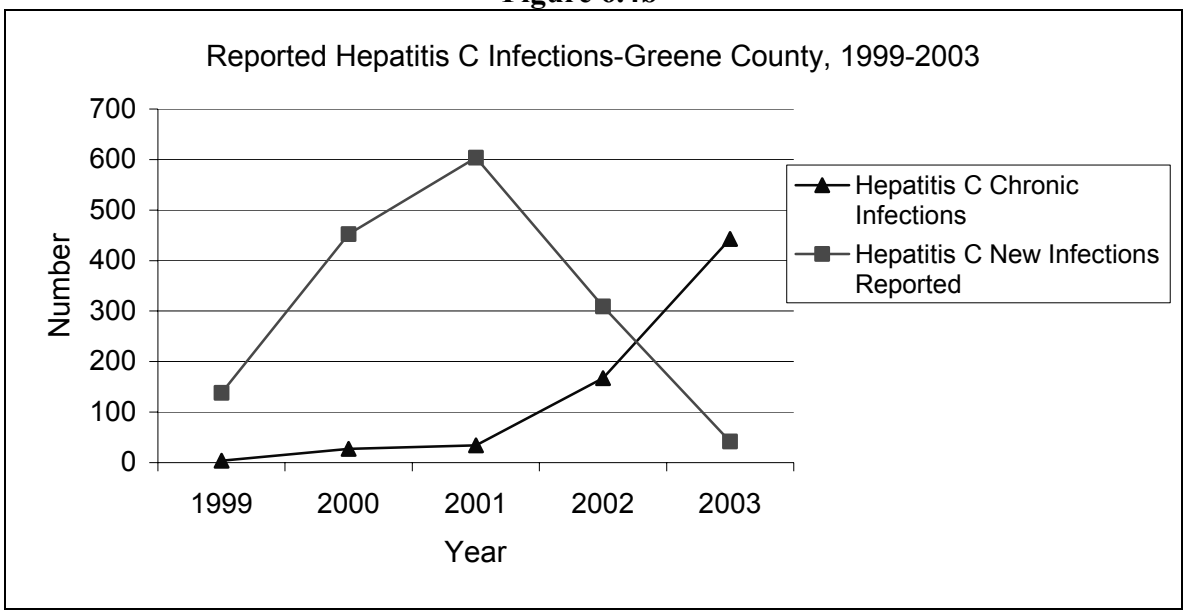
Source: Springfield-Greene County Health Department

Hepatitis C

Approximately 80% of those infected with the Hepatitis C virus (HCV) do not have signs or symptoms of infection. Symptoms of HCV infection include fatigue, abdominal pain, decreased appetite, nausea, dark urine and jaundice. Death occurs in <3% of those who are chronically infected with the virus. However, 70-85% of those initially infected will develop a chronic infection with 70% of those individuals eventually developing chronic liver disease. Chronic Hepatitis C infection is the leading cause of liver transplants. The virus is transmitted through blood and body fluids of an infected person. Common methods of transmission include sharing of intravenous needles, tattoos, body piercing, or sharing of items such as razors or toothbrushes that might have had blood on them. Hepatitis C is a hearty virus and can survive up to 4 weeks outside the body in certain conditions. Unlike Hepatitis B, the risk of transmission of Hepatitis C through sex is considered low.

Figure 6.4b illustrates the trends that are occurring in Greene County. The number of new cases of Hepatitis C identified and reported increased dramatically from 1999 to 2001 and decreased substantially after that. The numbers of chronic infections of Hepatitis C were shown to increase after 2001. Chronic infection is defined as those who are infected with HCV and when retested after treatment are found to still have the virus present.

Figure 6.4b

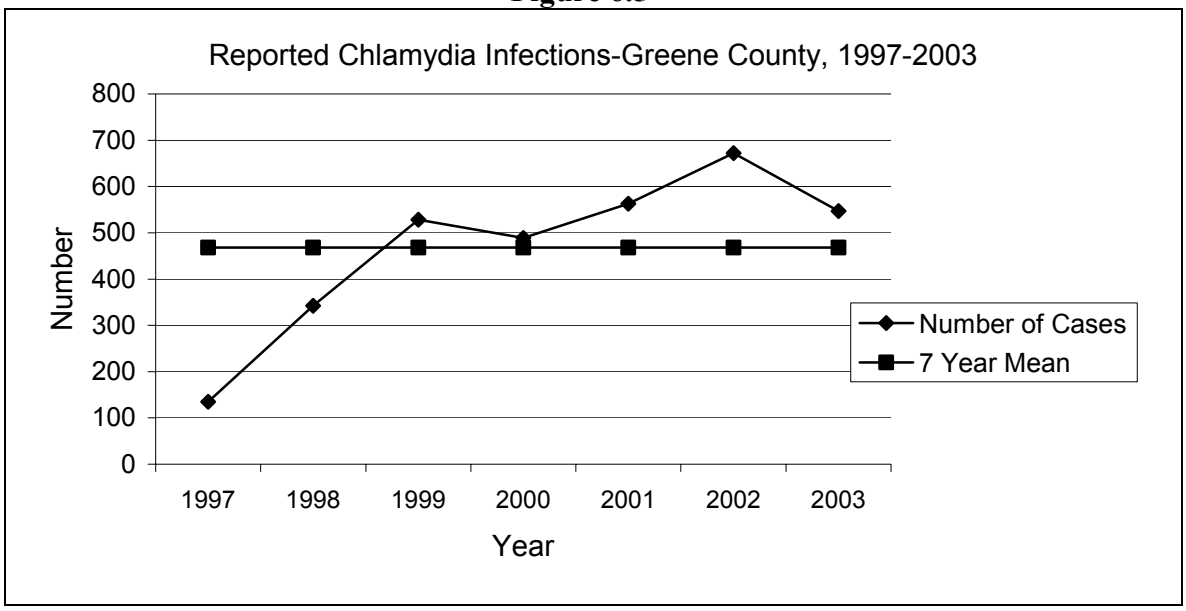


Source: Missouri Department of Health and Senior Services

Chlamydia

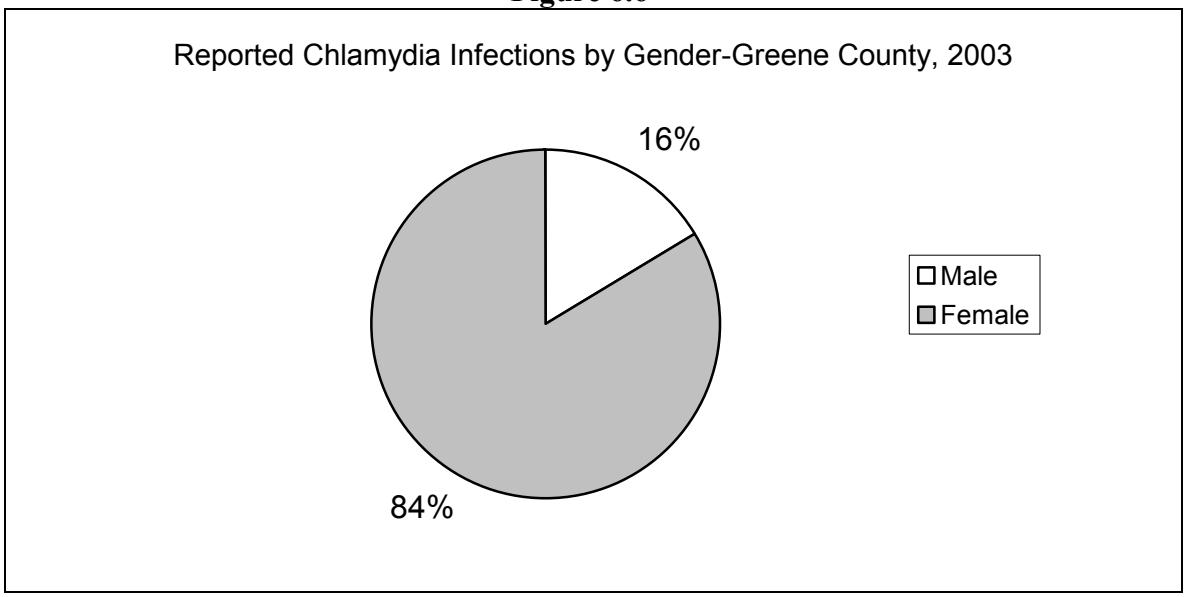
Chlamydia is a sexually transmitted infection caused by the bacteria *Chlamydia trachomatis.* Infection can occur in the anus, oral cavity, female cervix, and male urethra. If untreated, severe complications can occur. Figure 6.5 illustrates the increasing trend present in Greene County from 1997 to 2003. The gender distribution of the disease for the year 2003 is shown in Figure 6.6.

Figure 6.5



Source: Springfield-Greene County Health Department

Figure 6.6

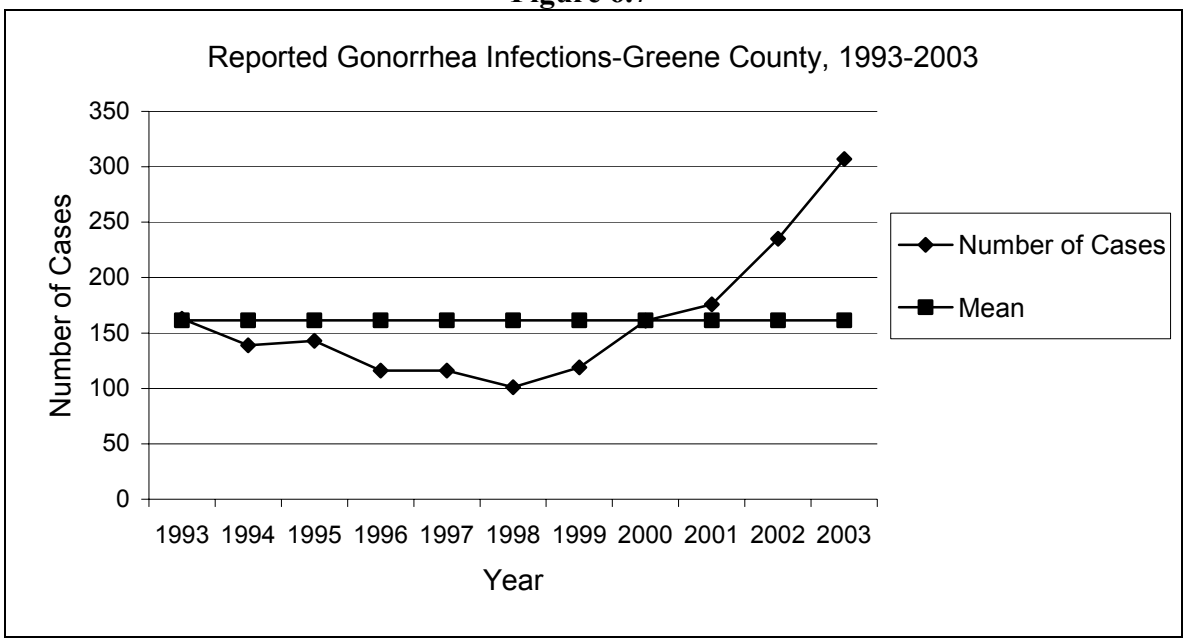


Source: Missouri Department of Health and Human Services

Gonorrhea

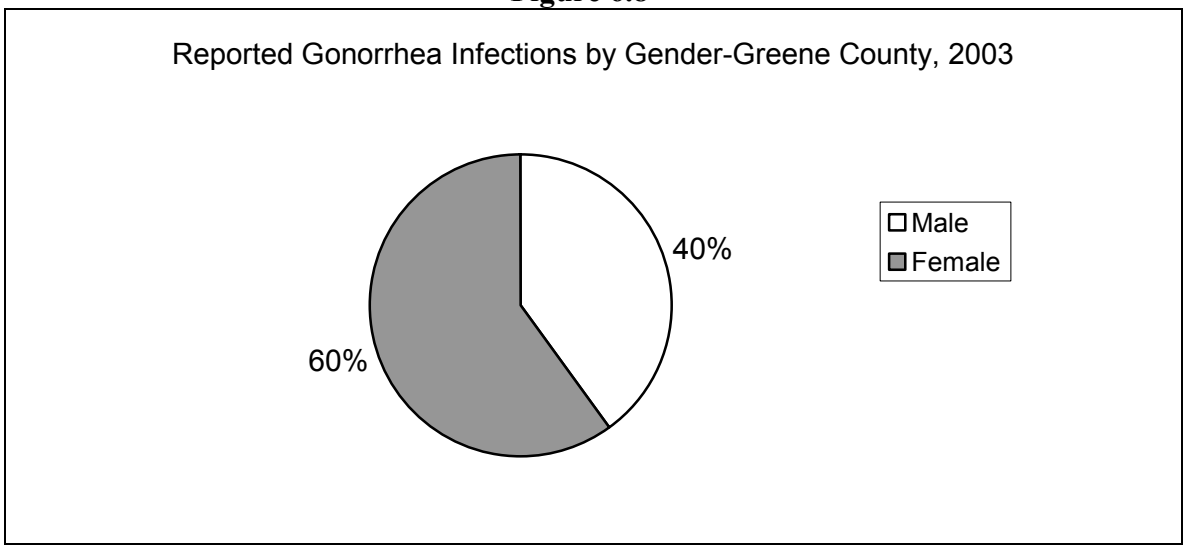
Gonorrhea is a sexually transmitted infection caused by the bacteria *Neisseria gonorrhoeae.* The disease is characterized by a purulent discharge 2 to 7 days after exposure. If left untreated, females can develop pelvic inflammatory disease which can result in infertility. Figures 6.7 and 6.9 indicate the ten-year trends in Greene County by number and rate from 1993 to 2003. Although a decrease was observed in the mid-1990s, a significant increase was observed from 1998 to 2003.

Figure 6.7



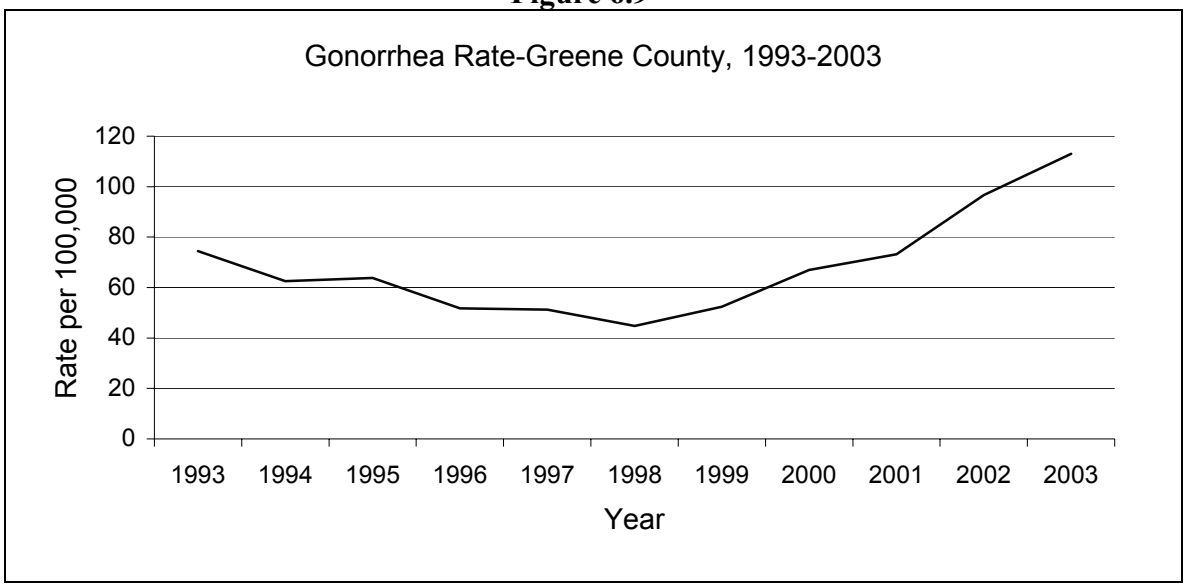
Source: Springfield-Greene County Health Department

Figure 6.8



Source: Missouri Department of Health and Human Services

Figure 6.9

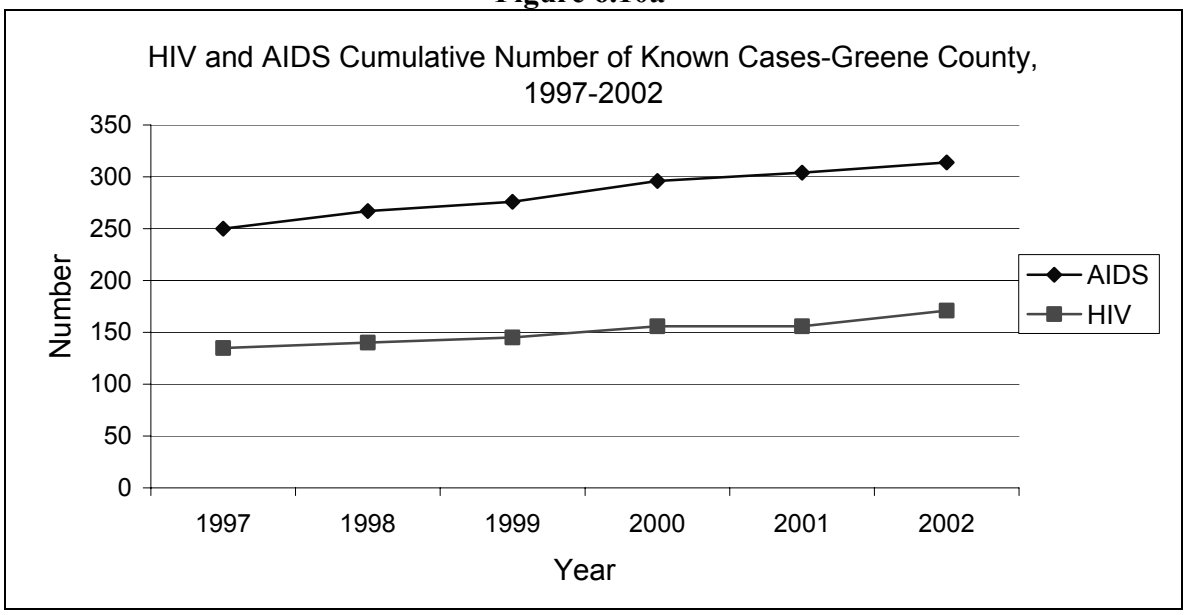


Source: Springfield-Greene County Health Department

HIV and AIDS

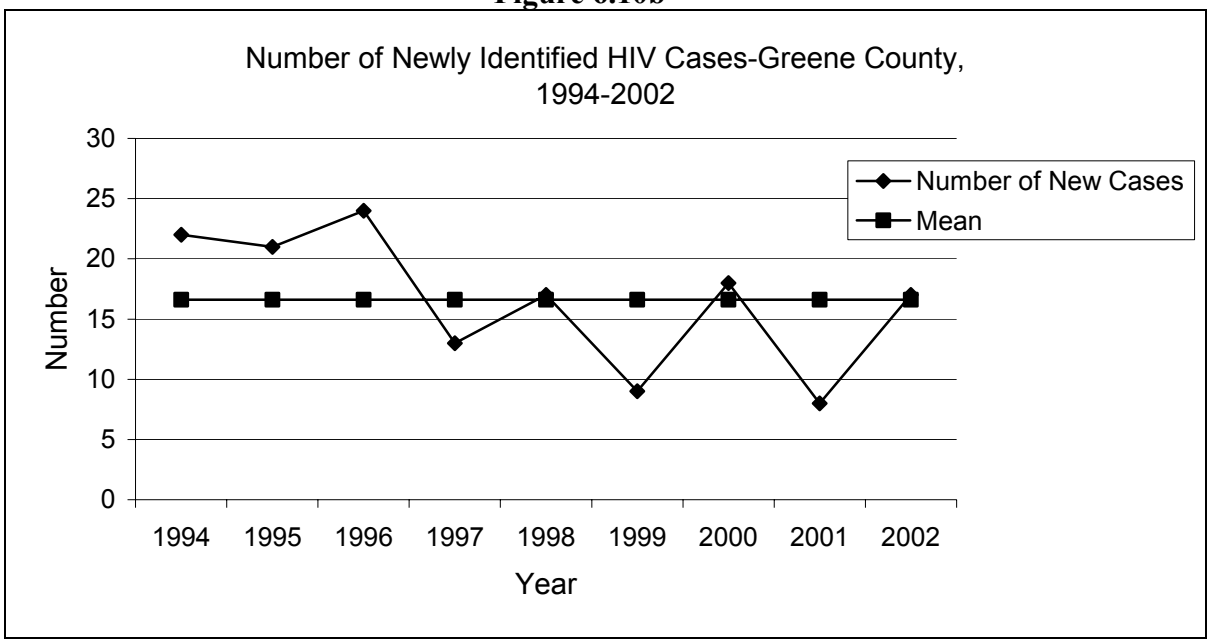
The Human Immunodeficiency Virus (HIV) is the causative agent that leads to Acquired Immune Deficiency Syndrome (AIDS). Better treatments are available to slow the progression to AIDS, but a cure still does not exist. Unfortunately, the numbers of HIV and AIDS cases continue to increase in Greene County, with over 300 identified men, women, and children infected in Greene County and an increase in new cases (17) identified in 2002 over the previous year (Figure 6.10a and 6.10b).

Figure 6.10a



Source: Springfield-Greene County Health Department

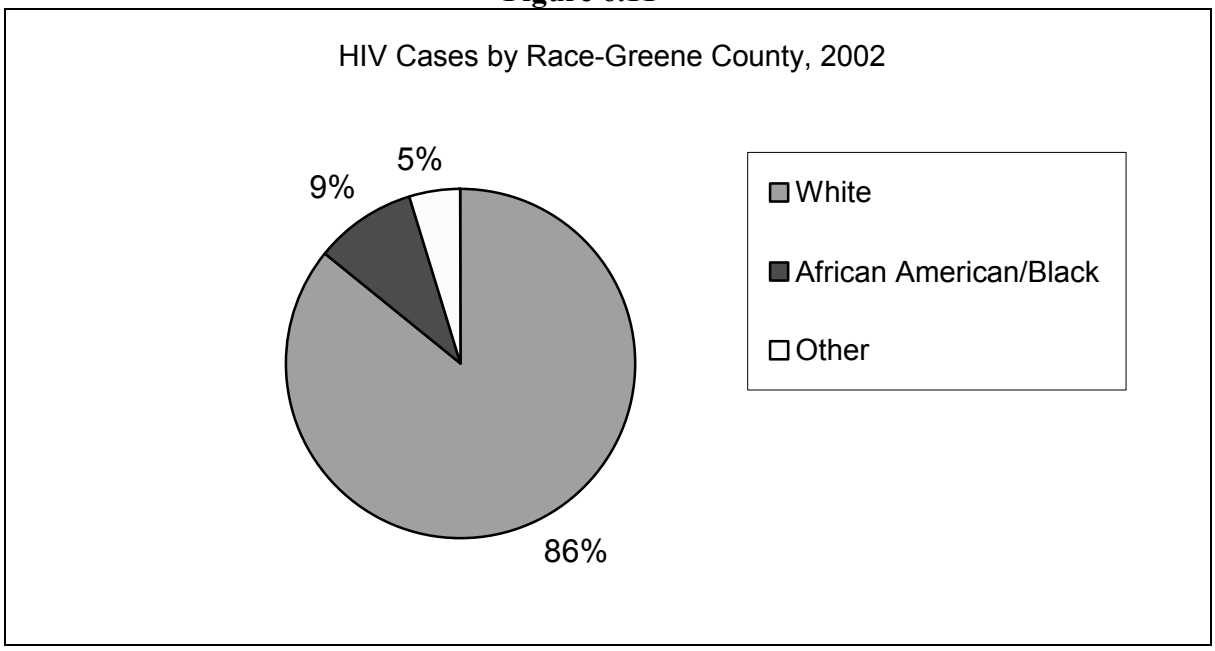
Figure 6.10b



Source: Missouri Department of Health and Senior Services

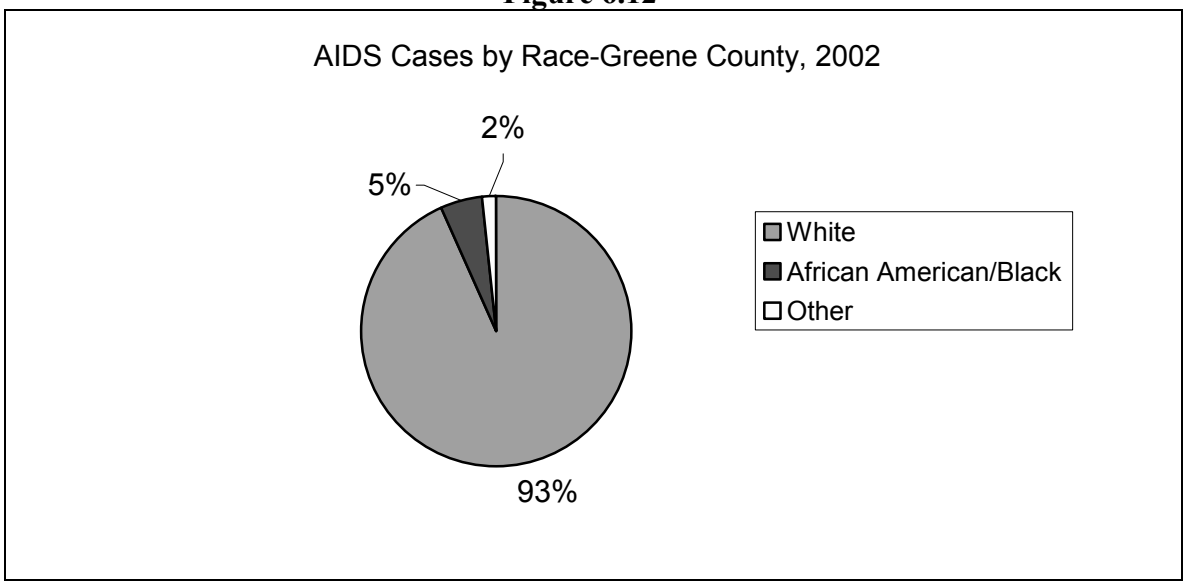
The majority of cases of HIV in Greene County have been identified in the White population. Other racial and ethnic groups accounted for 14% of the cumulative HIV patients (Figure 6.11). The racial and ethnic distribution of cumulative AIDS cases displayed a similar pattern (Figure 6.13).

Figure 6.11



Source: Missouri Department of Health and Senior Services

Figure 6.12



Source: Missouri Department of Health and Senior Services

Table 6.1 lists characteristics of HIV and AIDS patients identified in Greene County in 2002. The categories examined include: *Intravenous Drug Users* (IDU), *Heterosexuals*, and *Men Having Sex with Men* (MSM).

Table 6.1

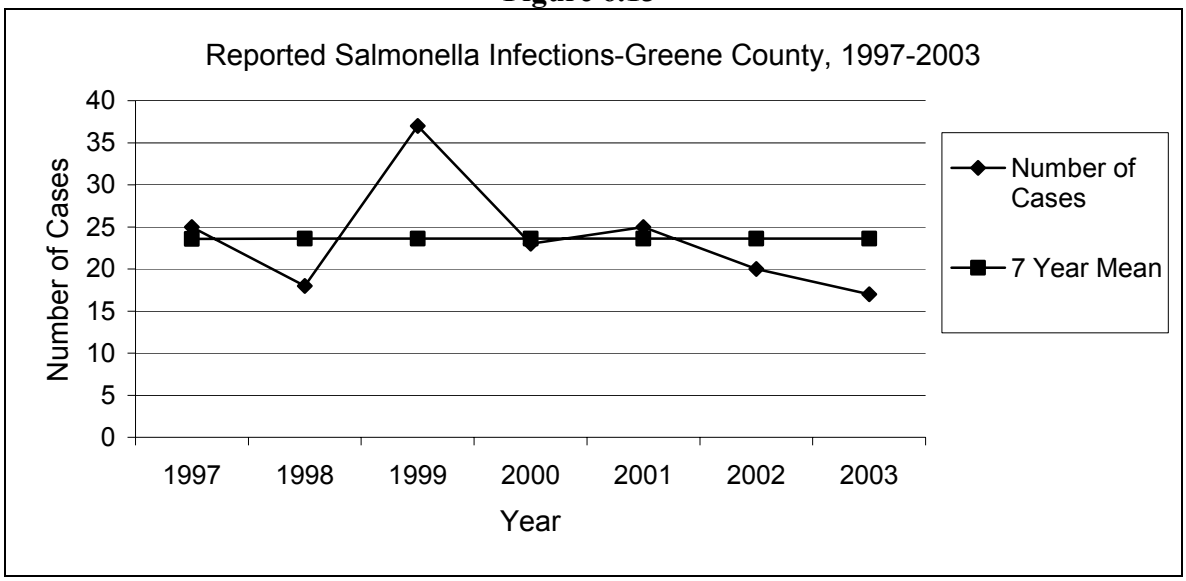
Profile of Cumulative HIV and AIDS Cases-Greene County, 2002				
	Total	**White**	**Black**	**Other**
Reported HIV Cases	171	147	16	8
Percent	100	86.0	9.4	4.7
Reported HIV Cases, MSM	87	84	2	1
Percent	51.0	96.5	2.3	
Reported HIV Cases, MSM/IDU:	13			
Percent	7.6			
Reported HIV Cases, IDU	23			
Percent	13.5			
Reported HIV Cases Heterosexual	23	13	8	2
Percent	13.5	56.5	34.8	8.7
Unknown	25			
Reported AIDS Cases	314	293	16	5
Percent	100	93.3	5.1	1.6

Source: DHSS, 2002 Missouri HIV/STD Epidemiological Profile

Salmonella

Salmonella is a bacterial disease transmitted through the fecal-oral route and can be food-borne. Major risk factors include cross contamination and improper temperature handling during food preparation. The symptoms include fever, headache, abdominal pain, diarrhea, nausea, and sometimes vomiting. Dehydration in infants and the elderly can be severe. The incubation period is from 6 to 72 hours, usually 12 to 36 hours.

Figure 6.13



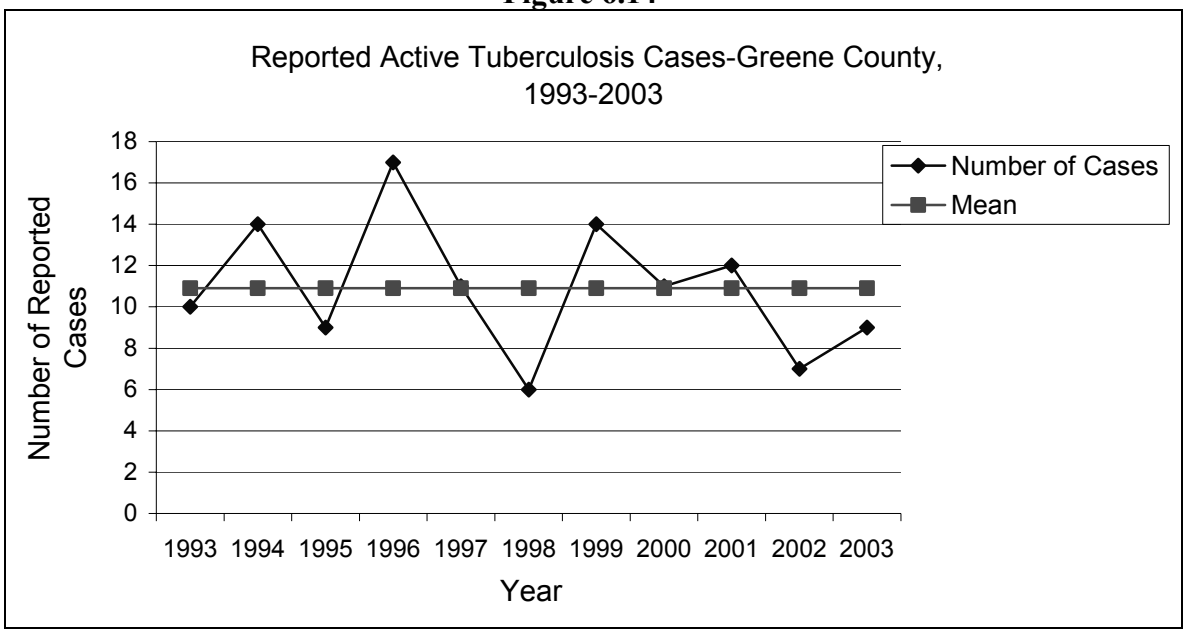
Source: Springfield-Greene County Health Department

Tuberculosis

Tuberculosis is a respiratory disease caused by the bacteria *Mycobacterium tuberculosis.* This disease is a major public health threat causing many deaths and disabilities worldwide. Initial infection usually goes unnoticed and results in lifelong risk of reactivation of disease. If untreated, approximately 50% of those infected will die within 5 years and usually within 18 months. This disease is treatable with antibiotics, but failure to complete the treatment may result in the development of antibiotic-resistant strains of the bacteria, which are more difficult to treat.

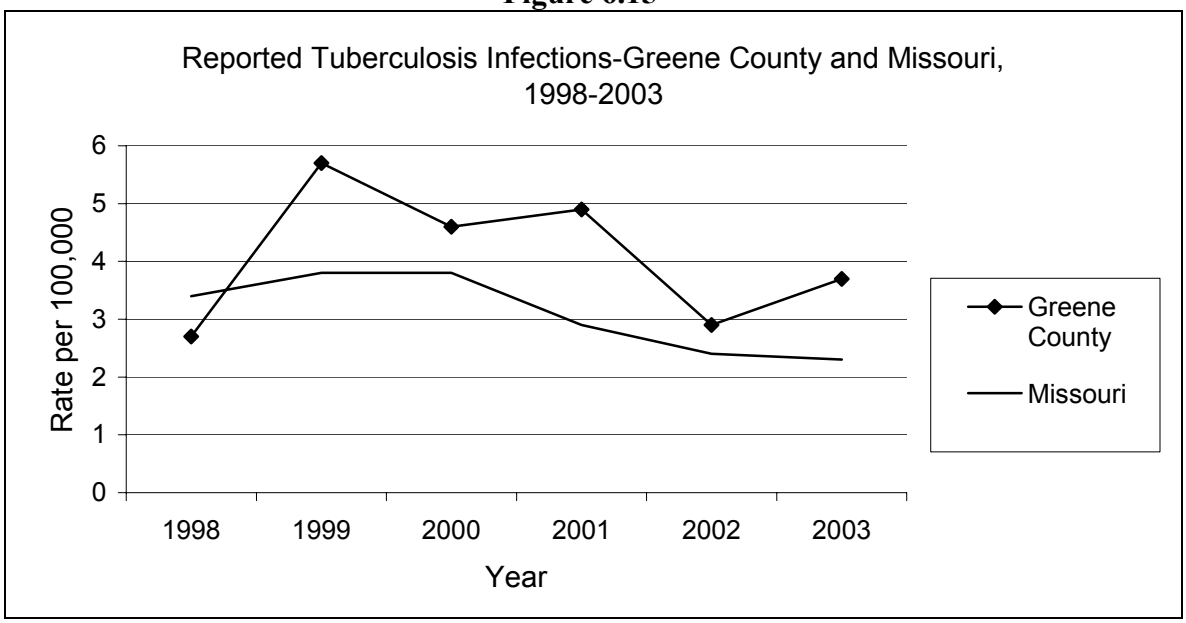
Figure 6.14 displays the number of active cases of tuberculosis from 1993 to 2003 in Greene County. The mean for this period was 10.9 active cases per year. The rate of infection for Greene County from 1998 to 2003 is indicated in Figure 6.15, with the county's rate per 100,000 remaining higher than the state's rate.

Figure 6.14



Source: Springfield-Greene County Health Department

Figure 6.15



Source: Springfield-Greene County Health Department

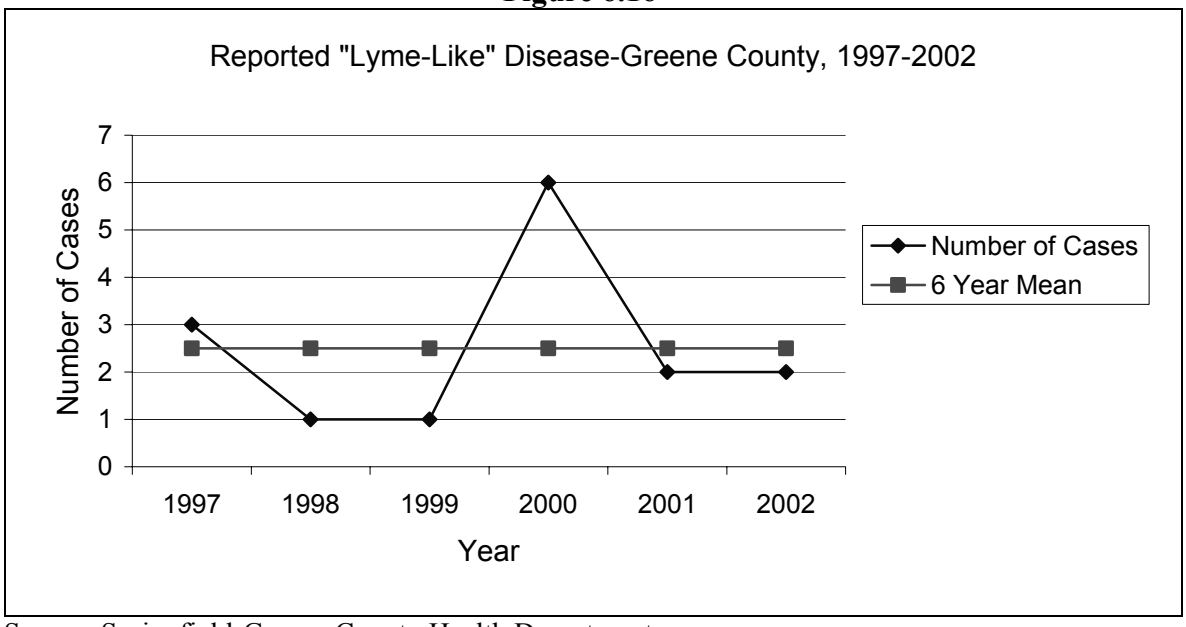
Vector-Borne Diseases

Vector borne diseases are those that involve an insect or animal in the mode of transmission. A few examples of vectors include mosquitoes, ticks, fleas, and rodents. Vector borne diseases are combated through disease surveillance and vector control. The recent experience with West Nile Virus is an excellent example of how public health can manage threats from vector-borne diseases.

Lyme Disease

Lyme disease is a tick-borne disease caused by the bacteria *Borrelia burgdorferi.* Currently in Greene County Lyme disease has not been definitively diagnosed as being present. This is due to the suspected cases failing to meet all of the diagnostic criteria to be classified as a confirmed case. Cases that meet some but not all of the criteria are classified as "Lyme-like" disease. The numbers of cases from 1997 to 2002 are plotted in Figure 6.16.

Figure 6.16

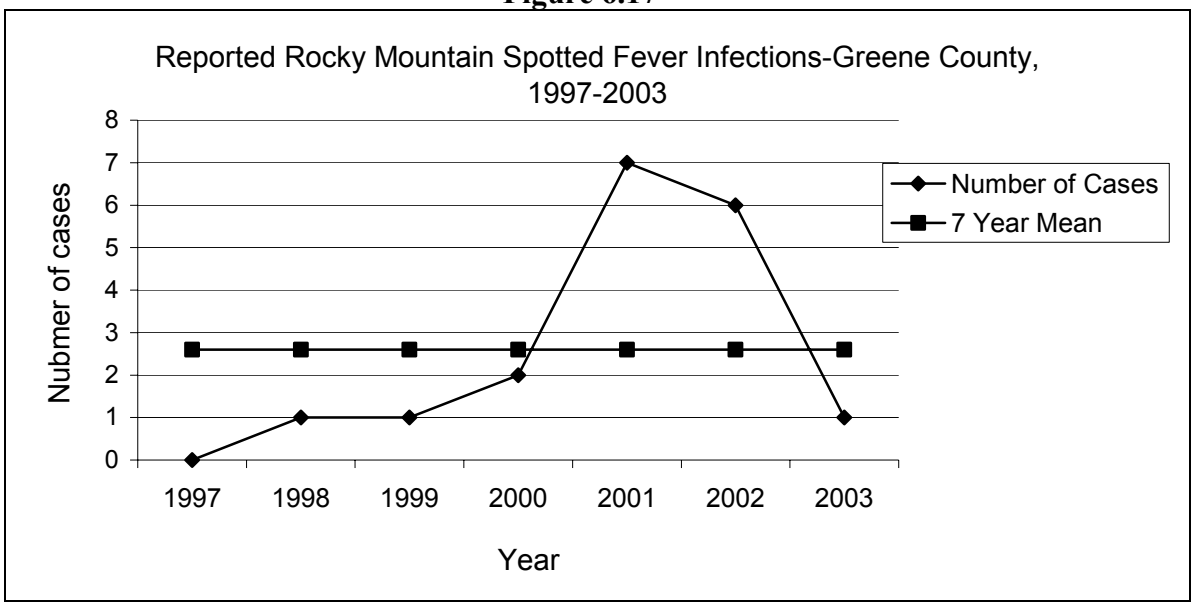


Source: Springfield-Greene County Health Department

Rocky Mountain Spotted Fever

Rocky Mountain Spotted Fever is a tick-borne disease caused by *Rickettsia rickettsii*. The disease occurs throughout the United States from April through September. If untreated the case-fatality rate ranges from 13 to 25%, but death is uncommon if treated properly. Figure 6.17 illustrates the number of reported cases for Greene County from 1997 to 2003.

Figure 6.17



Source: Springfield-Greene County Health Department

West Nile Virus

West Nile Virus (WNV) is spread by mosquitoes and typically infects horses, birds, wildlife, and humans. The virus causes fever, headache, body aches, malaise, arthralgia or myalgia, and rash. Severe illness in humans can include fatal encephalitis (inflammation of the brain). Illness from West Nile Virus is not usually severe with the majority of people not exhibiting any symptoms. However, everyone should follow precautions to avoid bites from mosquitoes, especially those individuals who are older or immunocompromised.

In the Spring of 2002, the Springfield-Greene County Health Department began testing dead birds and mosquitoes in an attempt to identify the presence of WNV in the county. By the end of the 2002 mosquito season, the virus had been identified in one dead bird in Greene County. Across the state in 2002, 168 human cases with 7 deaths were identified. In addition to the human impact, 277 birds and over 600 horses tested positive for WNV. West Nile Virus has spread as far north as Canada, as far south as Mexico, and as far west as California. By the end of the mosquito season of 2003, Greene County had collected and tested many birds with 6 of the dead birds testing positive for WNV. West Nile Virus is now considered endemic to the area, meaning that the virus will be regularly present. Mosquito and dead bird surveillance continues in the county in an effort to identify those areas that may have increased mosquito populations and increased risk.

Table 6.2

Positive Test Results For West Nile Virus-Greene County, 2003	
	Number
Human	1
Horses	9
Birds	6

Source: Missouri Department of Health and Senior Services, Division of Environmental Health and Communicable Disease Prevention

Diseases of Low Incidence

Table 6.3 lists those reportable diseases that pose a significant health threat and need to be monitored and controlled but occur sporadically in the county.

Table 6.3

Reported Diseases of Low Incidence-Greene County, 1997-2003		
	Total Cases 1997-2003	**7 Year Mean**
E-coli 0157:H7	11	1.6
Ehrlichiosis	14	2.0
Legionellosis	18	2.6
Brucellosis	2	/
Hepatitis A*	382	54.6
Rocky Mountain Spotted Fever	18	2.6
"Lyme-like" Disease	15	2.1
Tularemia	10	1.4
Syphillis Deaths	2	/
Toxic Shock Syndrome	12	1.7
Pertussis	6	0.9
Meningococcal Disease	14	2.0
Meningococcal Meningitis	11	1.6
Streptococcus, Group A Invasive	14	2.0
Malaria	10	1.4

Source: Springfield-Greene County Health Department

*From 1997 to 1999 there was a high incidence of Hepatitis A (249/170/118 respectively) associated with a widespread outbreak. Since this time, the number of Hepatitis A cases reported has been approximately 5 per year.

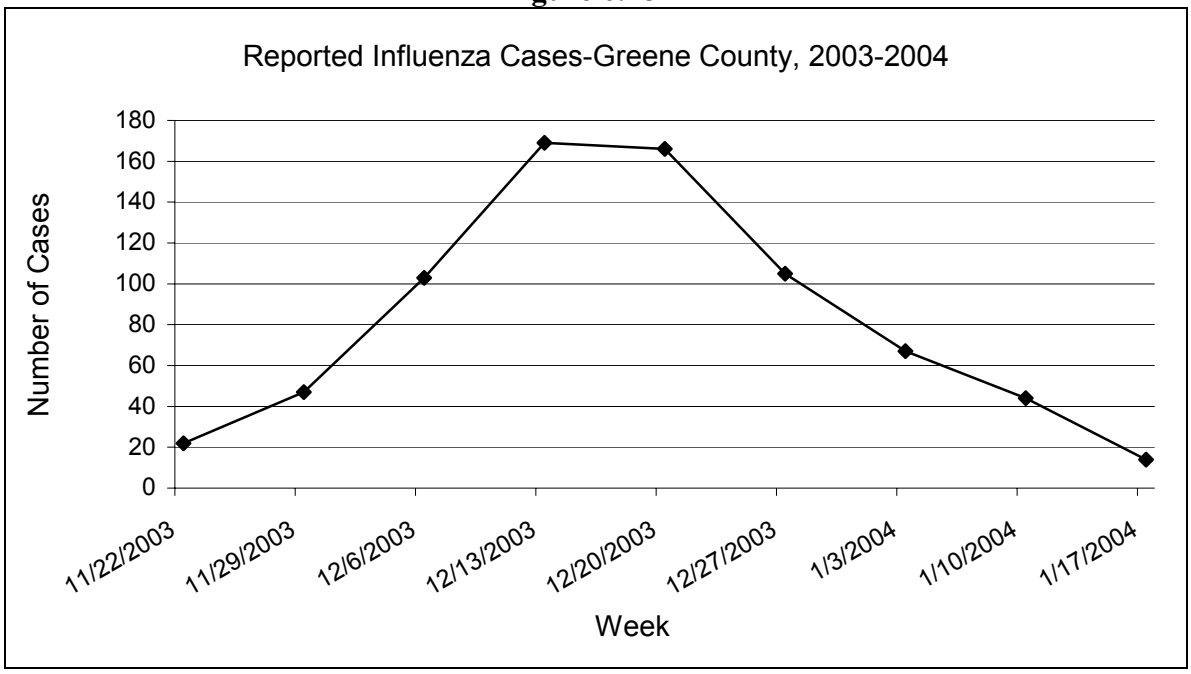
Influenza

Influenza is more commonly referred to as the "flu" and is caused by a number of influenza viral types. The severity of the disease varies from mild to severe illness, with life threatening complications and death occurring quite frequently. The Centers for Disease Control and Prevention estimates that 10-20% of the U.S. population contracts the disease annually, resulting in 36,000 deaths nationwide. Symptoms usually include fever, headache, extreme tiredness, dry cough, sore throat, runny or stuffy nose, and muscle aches. Symptoms such as nausea, vomiting, and diarrhea are associated more with children than adults (CDC 2003). Those people who are at increased risk for developing severe illness include seniors**,** people who have chronic medical conditions, pregnant women, and children.

The best method of protection against the flu is by vaccination each fall. If the vaccine is unavailable, other ways to protect yourself and others from the virus include avoiding close contact with people who are sick; staying home when you are sick; covering your nose and mouth with a tissue when sneezing or coughing; washing your hands often; and avoiding hand contact with your eyes, nose, or mouth.

Figure 6.18 illustrates the number of cases reported by week for Greene County during the peak of the influenza season of 2003-2004. This particular year was viewed as being significantly severe with an earlier onset than usual.

Figure 6.18



Source: Springfield-Greene County Health Department

Bioterrorism/Emergency Response Team

The events of September 11, 2001, have greatly altered the mind-set of most Americans and United States defense agencies. Likewise, the Springfield-Greene County Health Department has also had to rethink its procedures and mission.

After the first Anthrax letters were identified in 2001, the Springfield-Greene County Health Department started receiving concerned calls regarding unknown powders found in the Springfield community. In response to this community issue, an around the clock Emergency Response Team was formed from the Bioterrorism/Emergency Response Team (BERT) unit and other members of the health department. This team investigated numerous calls regarding powders and is still in existence today providing continuous coverage to the community on health-related issues.

The Springfield-Greene County Health Department is currently in the second year of a federal grant that established the BERT unit. This group of professionals consists of one Planner, two Epidemiology Specialists, one Public Information Specialist, one Educator & Volunteer Coordinator, and 1.5 Administrative Assistants.

Team members have various counties in the southwest Missouri Troop D region in which to provide services:

- The Planner assists in four counties: Greene, Christian, Dallas, and Webster.
- The 2 Epidemiology Specialists cover a total of eight counties: Greene, Christian, Dallas, Webster, Polk, Cedar, Hickory, and St. Clair.
- The Public Information Specialist and the Educator & Volunteer Coordinator provide assistance to all eighteen counties in the Troop D region.

<u>BERT Activities and Accomplishments:</u>

- The Planner has assisted in putting together Emergency Response plans for four Local Public Health Departments with coordination of each county's Office of Emergency Management and other local agencies. These four separate plans have one common section that coordinates a regional response for providing mass prophylaxis to the citizens and visitors of Greene, Christian, Dallas, and Webster counties. This treatment plan was established with the guidance of the Centers for Disease Control and Prevention's (CDC) Strategic National Stockpile (SNS) planning guide and the Missouri Department of Senior Services (DHSS) state plan.

- The BERT unit has successfully planned, conducted, and participated in several bioterrorism and emergency response disaster exercises in Missouri during the last two years, including a simulation of dispensing mass prophylaxis at a local high school dispensing site in 2003. In 2004, a Troop D regional SNS response

was exercised with all 18 Southwest Missouri local public health agencies participating.

- The Epidemiology Specialists have trained and assisted all eight county health departments in disease surveillance activities. Electronic data entry is now in place in all eight counties for communicable disease investigations allowing for better statewide surveillance. Specific community partners report to the epidemiologists for health and disease tracking in the region.

- The Public Information Specialist has started and maintains the BERT website www.swmobert.com, which provides information from each of the eighteen local public health departments in the Troop D region. Each county has also had the option of a separate linked website for their individual county.

- Numerous media events and messages have been coordinated for the region through the BERT Public Information Office, including large-scale natural disaster events. Public Health messages have been coordinated into a Health Status Alert System (HSAS) in which each message is coded to a level of urgency. Those levels are green, yellow, or red.

  Code Green – Health Information
  Messages in this level have no immediate health concerns, but the general public should have the information.

  Code Yellow – Health Caution
  Messages in this level have a specific health-related situation or conditions that may require more attention.

  Code Red – Health Alert
  Messages in this level are of the highest level of importance and require immediate attention and action.

- The BERT Educator & Volunteer Coordinator is a new addition to the Unit, as of 2004, and has designed a volunteer recruitment and retention plan for the region. Implementation of this plan will start in the summer of 2004.

- The Health Alert Network (HAN) is one of the tools that the heath department now has for sending information rapidly to large groups in the community. The HAN database has thirteen categories: physicians and health care providers, emergency response personnel, local health departments, large employers' nurses, local emergency planning committees and emergency management offices, grocers, infection control nurses, law enforcement agencies, medical examiners and mortuaries, media contacts, pharmacies, veterinarians, school nurses, and others. The HAN is an e-mail/Fax system that sends the same message to all the contacts that are chosen for that particular message in one simple mailing.

- The BERT Unit was involved with the CDC smallpox vaccination program in 2003 for Phase I, which screened 190 individuals and vaccinated 180 health care providers. In 2004, first responders were vaccinated during Phase II of this program.

- Many educational sessions have been given by BERT members to provide the community with information on bioterrorism agents classified by the CDC in Categories A, B, and C. A more in-depth discussion of these bioterrorism agents is found on the BERT website, as well as on CDC's.

- Community outreach and education also resulted in local agencies and businesses looking at their individual facilities for risk reduction and increased security.

The BERT is continually striving for a safer, better planned, emergency response for the Springfield-Greene County community.

For More Information, Please Refer to These Works Cited and Consulted

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Springfield-Greene County Health Department.
Website: http://www.ci.springfield.mo.us/health/

"Life is pleasant. Death is peaceful. It's the transition that's troublesome."

Isaac Asimov

“Every small, positive change we make in ourselves repays us in confidence in the future.”

Alice Walker

“Persuasion is often more effectual than force.”

Aesop

“Be kind, for everyone you meet is fighting a hard battle.”

Plato